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The Cosmic Ray Tagger system of the ICARUS detector at Fermilab

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The goal of the Short Baseline Neutrino (SBN) experiment at Fermilab is to confirm, or definitely rule out, the existence of sterile neutrinos at the eV^2 mass scale. SBN searches both for ν_e appearance and ν_μ disappearance signals from the oscillation $\nu_\mu \rightarrow \nu_e$ in the Booster Neutrino Beamline. For this purpose neutrino interactions will be observed by two Liquid Argon TPC detectors at near (100 m) and far (600 m) positions from the neutrino source. The Far Detector (ICARUS T600) is a high granularity uniform self-triggering detector with 3D imaging and calorimetric capabilities allowing to reconstruct ionizing events with complex topology. ICARUS T600 is located at shallow depth, therefore in order to mitigate the background from cosmic muons a Cosmic Ray Tagger (CRT) system ensuring a 4π detector coverage was installed and integrated in the experiment data acquisition. The CRT system aims at tagging particles with a time resolution of few ns during the 1 ms drift time window of the TPC to disentangle cosmic rays from tracks that originated in an interaction inside the detector. In this talk an overview of the CRT system, its role as a tagger system and its performances will be presented.

In-person participation

Yes

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